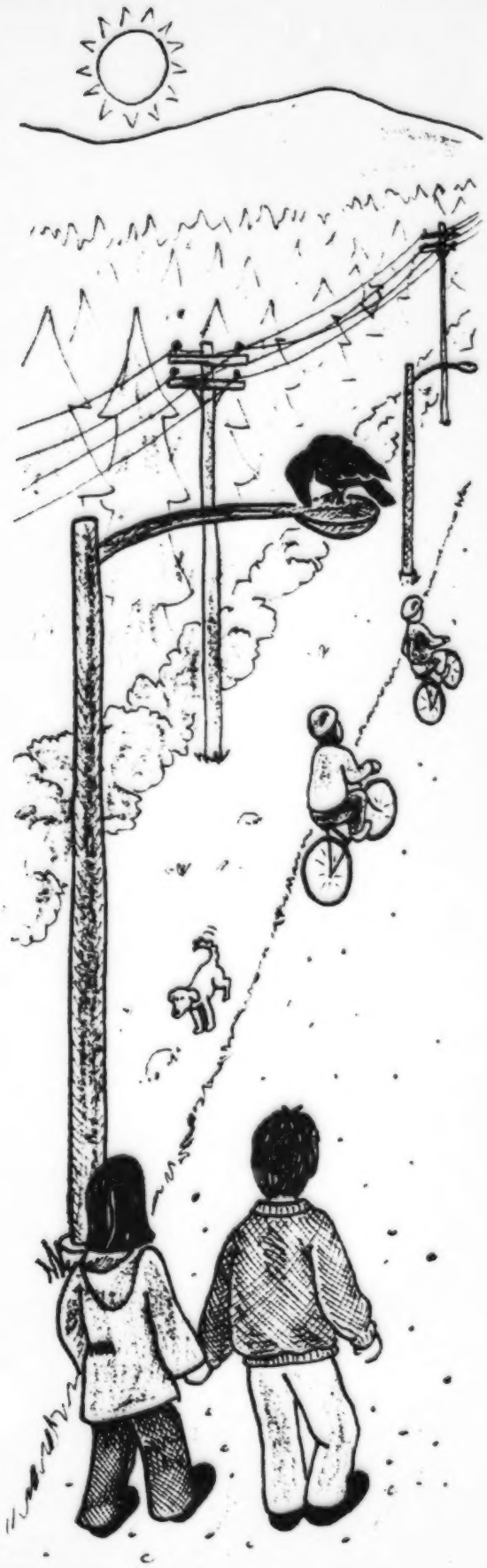

PRINCIPLES OF SUPPLY OPTIONS FOR THE YUKON

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Cabinet Commission on Energy

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Principles of Supply Options for the Yukon

The Yukon government is in the process of developing a comprehensive energy policy which will address several issues including the potential of alternative energy supply options and the use of the territory's undeveloped energy resources. As the territory's economy is developed and the demand for electrical energy increases, this challenge can be met by developing new sources of power generation and by better utilization of the existing resources. This paper sets out a series of government principles which will guide the choices to be made in the future by those whose task it will be to select the resource that will provide our electricity.

Energy resources

In 1997, the Cabinet Commission on Energy released a series of energy resource papers, prepared by the Department of Economic Development. These resource papers provided an overview of wood, hydro, coal, oil and gas, and wind, as well as alternative technologies, and the factors affecting their development in the Yukon. These papers are designed to promote discussion among industry, government and the community about potential energy sources for the Yukon.

A brief description of each article follows:

1. Hydro

During the 1992 capital plan process before the Yukon Utilities Board, the Yukon Energy Corporation and the Yukon Electrical Company Limited identified thirty-three potential hydro sites in the territory ranging from less than one megawatt of power to twenty megawatts.

2. Wood

The territory has a constant and renewable supply of wood. Between 1986 and 1992, fires created an annual average of 1,200 sq. km of burned wood, and one such year's supply would produce enough fuelwood to heat every building in the Yukon for thirty years. Although abundant in supply, wood is not generally seen as a cost effective way to generate electrical power unless it has little or no cost as a fuel source.

3. Wind

Wind power has been used on a small scale in the territory since the 1950s, although predominantly in isolated localities. Using wind to generate electricity that can offset the use of diesel during the winter months has shown some promise.

In 1993, YEC installed a commercial wind turbine on Haeckel Hill in Whitehorse and connected it to the electrical grid. It has been producing electrical power to the grid since then. The Corporation continues to assess the

potential of wind power and determine the viability of installing several more turbines in the Whitehorse area. In addition, the Corporation is monitoring wind sites at Old Crow and elsewhere to test the wind regime for future possible development.

4. Oil and Gas

The Yukon is relatively unexplored in terms of its oil and gas potential although there are known gas reserves and sealed oil wells in the Eagle Plains area. The Kotaneelee gas field in southeastern Yukon is currently producing approximately twice as much energy as Yukoners use annually but due to its location, the gas is being piped south and not utilized in the Yukon.

5. Coal

There are over one hundred known occurrences of coal in the Yukon and efforts to develop the resource have taken place in four areas namely: Division Mountain; Whitehorse Coal; Bonnet Plume; and Rock River. Many provinces, such as Alberta, Saskatchewan and Nova Scotia, rely heavily upon coal to generate their electricity. Its contribution to greenhouse gas production cannot be diminished, however as technology progresses, this abundant resource may take its place as an environmentally acceptable form of electrical generation.

6. Alternatives

This paper provides an overview of alternate energy technologies that have been or could be developed in the Yukon including such potential sources of electrical energy supply as solar, geothermal, refuse derived and the future potential of emerging technologies such as the hydrogen fuel cell. All of these local supply options can be utilized to reduce the territory's dependence on imported fossil fuels (diesel oil).

7. Energy efficiency in the Yukon

This article describes how additional supply or capacity can be added to our electrical system through energy conservation. Using energy more efficiently reduces the demand by customers and allows greater use of the existing energy supply to serve additional customers. Low voltage fluorescent lights, timers for vehicle plug-ins, low flow shower heads and programmable home thermostats are examples of how customers might conserve electrical energy to free-up capacity on the system.

Interties

Most electrical systems in Canada can exchange power with neighbouring jurisdictions to balance surpluses and shortages. The Yukon's main electrical grid (Whitehorse-Aishihik-Faro system) is isolated from an external supply (e.g. British Columbia, Alberta, Alaska), making it critical to match electricity supply and demand within the territory.

Supply planning and public policy

Planning and developing options for energy supply has become a key component of public energy policy. Historically, utility companies performed this role, basing their planning decisions on the lowest-cost means of providing power to meet any level of demand.

Rising energy production costs, combined with pressure from an environmentally-conscious public, has led many utilities, and government, to adopt demand side management (DSM) initiatives aimed at reducing energy consumption. In this changing climate, supply planning must now take into account social and environmental policies that are publicly dictated.

In the Yukon, several First Nations have concluded Final Agreements which gives them a new role in energy planning as provided in the Umbrella Final Agreement.

Governments at all levels will assume a new role in energy planning, with sustainability emerging as the guiding principle in public policy governing all energy forms and sectors. In this context, the focus of supply planning has shifted from lowest-cost considerations alone to how it relates to other aspects of energy planning to meet the goals of sustainable development and environmental preservation.

One outcome of this shift has been the development of a model known as community energy management, or CEM. In this model, which is discussed in greater detail in the Commission's *Energy Options for the Yukon* paper, communities or small regions engage in a multi-step planning process that first sets out the values and goals of the community (such as long-term employment, economic diversification, affordable energy and cleaner air). It then moves on to identify the community's energy preferences, including supply preferences, to help meet these non-energy based goals. Community-based supply planning includes utilities as stakeholders and partners, but the planning process is different from that traditionally used by the utilities. The focus in CEM is on potential gains in efficiency, sustainability and other community benefits. Supply decisions tend to favour local, small-scale initiatives (such as district heating and cogeneration), as well as energy-efficiency methods that reduce demand. A community may decide, for example, that it can best meet its sustainability goals by continuing to use existing supply technologies while reducing overall demand, rather than switching from fossil fuels to an alternative energy source as a means of generating electricity.

After a pattern of sustainability is established, there is a gradual tendency to move away from fossil fuel-based energy sources. This move is part of a comprehensive plan based on sustainability.

Principles of supply options

The Government's goal, as stated in the Throne Speech, December 4, 1996, is *"to ensure that Yukon people can derive maximum benefit from an energy supply and distribution system that is affordable, reliable, and environmentally responsible."*

The mission statement of the Cabinet Commission on Energy identifies four main goals to guide energy development:

- the sustainable development of our energy resources;
- the efficient use of energy;
- a secure supply of reliable energy; and
- affordable energy.

The Government is committed to maintaining local control of energy resources through public ownership of YEC while exploring investment opportunities with Yukon First Nations, municipalities and independent power producers as a way of attaining these goals.

The Government believes that energy should:

1. be affordable;
2. be reliable;
3. be environmentally responsible;
4. contribute to the reduction of greenhouse gas emissions;
5. reduce our dependence on imported fuels (diesel) by replacing them with local suppliers;
6. be reliable in supply;
7. provide for the sustainable development of energy resources; and
8. be accessible to potential consumers particularly in relation to industrial development.

The Government believes that development should:

1. avoid high cost, high risk, high debt projects without major customers to pay for them;
2. be a tool of economic growth: it should create employment opportunities for Yukoners; and
3. provide opportunities for public participation in policy development.

The following companion documents are available on request from the Yukon Government Main Administration Building Information Desk, municipal and First Nations' offices and community libraries.

Technical Background Paper on Electrical Rates and Relief
Discussion Paper on Electrical Rates and Relief
Electricity Risk in the Yukon
Opportunities for Community Energy Management in the Yukon
Energy Efficiency for the Yukon
Rate Stabilization Fund
Green Power Fund

Resource Papers: Wood, Coal, Wind, Hydro, Oil and Gas, Alternatives
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Energy for Tomorrow (1991)
Yukon State of the Environment Report (1995)
Yukon 2000 Consultation Process (1986-1988)
Yukon Economic Strategy (1988)
Yukon Fuel Enquiry (1988)